

WHAT IS CLAIMED IS:

1. A vibration wave driving apparatus
comprising:

5 a vibration member formed by an elastic member having an electro-mechanical energy conversion element fixed thereto, and having a through-hole in the central portion thereof;

a vibration member supporting member fixed to said vibration member;

10 a rotary member being in pressure contact with said vibration member, and having a through-hole in the central portion thereof;

15 an output shaft extending through the through-hole of said vibration member and said rotary member, and rotatable with said rotary member, said output shaft supporting said vibration member in said through-holes;

20 a case packaging said vibration member and said rotary member therein, and supporting said vibration member with the end portion of said vibration member supporting member fixed; and

a plurality of bearings for supporting said output shaft provided in said case.

25 2. A vibration wave driving apparatus according to Claim 1, wherein the through-hole itself of said vibration member provides a bearing surface.

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3. A vibration wave driving apparatus according to Claim 1, wherein the through-hole of said vibration member has a bearing supported by said output shaft.

5 4. A vibration wave driving apparatus according to Claim 3, wherein the bearing in the through-hole of said vibration member supported by said output shaft is a sliding bearing.

10 5. A vibration wave driving apparatus according to Claim 4, wherein the surface of said output shaft supporting the sliding bearing or the bearing surface of said sliding bearing is formed of resin.

15 6. A vibration wave driving apparatus according to Claim 3, wherein the bearing supported by said output shaft is disposed substantially at the node position of the vibration of the vibration member.

20 7. A vibration wave driving apparatus according to Claim 1, wherein at least one of the plurality of bearings provided in said case is a sliding bearing.

25 8. A vibration wave driving apparatus according to Claim 7, wherein the surface of said output shaft supported by the sliding bearing or the bearing surface of said sliding bearing is formed of resin.

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9. A vibration wave driving apparatus according to Claim 1, wherein the through-hole of said rotary member has a bearing supported by said output shaft.

5 10. A vibration wave driving apparatus according to Claim 9, wherein the through-hole itself of said vibration member provides a bearing surface.

10 11. A vibration wave driving apparatus according to Claim 9, wherein the through-hole of said vibration member has a bearing supported by said output shaft.

15 12. A vibration wave driving apparatus according to Claim 11, wherein the bearings in the through-holes of said vibration member and said rotary member supported by said output shaft are sliding bearings.

20 13. A vibration wave driving apparatus according to Claim 12, wherein the surface of said output shaft supporting the sliding bearing or the bearing surface of said sliding bearing is formed of resin.

25 14. A vibration wave driving apparatus according to Claim 11, wherein the bearing supported by said output shaft is disposed substantially at the node position of the vibration of the vibration member.

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15. A vibration wave driving apparatus according to Claim 9, wherein at least one of the plurality of bearings provided in said case is a sliding bearing.

5 16. A vibration wave driving apparatus according to Claim 15, wherein the surface of said output shaft supported by the sliding bearing or the bearing surface of said sliding bearing is formed of resin.

10 17. A vibration wave driving apparatus comprising:

a vibration member formed by an elastic member having an electro-mechanical energy conversion element fixed thereto, and having a through-hole in the central portion thereof;

15 a vibration member supporting member fixed to said vibration member;

20 a rotary member being in pressure contact with said vibration member, and having a through-hole in the central portion thereof;

25 an output shaft extending through the through-holes of said vibration member and said rotary member, and rotatable with said rotary member, said output shaft supporting said rotary member in said through-holes;

a case packaging said vibration member and said rotary member therein, and supporting said

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vibration member with the end portion of said
vibration member supporting member fixed; and
a plurality of bearings for supporting said
output shaft provided in said case.

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